

# Acceptance of long acting contraceptive methods and associated factors among women in Mekelle city, Northern Ethiopia

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**Abstract:** Background: Long acting reversible contraceptives are family planning methods that prevent unwanted pregnancy for at least three years and when removed return of fertility is prompt. It includes the intrauterine device and contraceptive implants. Despite the effectiveness and reversibility of fertility, the acceptance and utilization of long acting reversible contraceptive were very low in many developing countries including Ethiopia. Even though the optimal use of long-acting reversible contraception is a good strategy for reducing unintended pregnancy, acceptability to long acting reversible contraceptive is fundamental to effective and continuous use. Objective: This study was aimed to assess the acceptance of long acting reversible contraceptive methods and factors associated with it among women of reproductive age. Methods: An institution based cross sectional study was conducted from February to march 2013. Among 348 family planning users and systematic sampling method was used to select the study participants. Interviewer administered structured questionnaire was used to collect data. Bivariate analysis was employed to determine predictors of acceptability of long acting contraceptives and variables which were found to be significant at P - values < 0.05 in bivariate analysis were taken to multivariate logistic regression to see the independent effects of the factors on the acceptability of long acting contraceptives. Result: The acceptability of long acting reversible contraceptive was 16.4%. The main reasons mentioned for not accepting long acting reversible contraceptive was developing side effects 128 (44.8%), and fear of infertility after use 117(40.9%). More than half 181 (52.9%) of the women had a non-supportive attitude towards long acting contraceptives. Mothers who had a supportive attitude towards long acting reversible contraceptive was the only independent predictors of acceptability of long acting contraceptive (AOR=2, 95% CI (1.084, 3.75). Conclusions: The acceptance of long acting reversible contraceptives was very low. Supportive attitude towards long acting contraceptives was the only factors that affect acceptance of long acting contraceptive.

**Keywords:** Acceptance, Long Acting Contraceptive, Tigray, Ethiopia

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## 1. Introduction

Long acting reversible contraceptives are family planning methods that prevent unwanted pregnancy for at least three years and when removed return of fertility is prompt. It includes the intrauterine contraceptive devices and the subdermal implants. These contraceptives offer a

better protection against unwanted pregnancy. Effective contraceptive could prevent as many as one in every three maternal deaths by allowing women to delay motherhood, space births, avoid unintended pregnancies and abortions, and stop childbearing when they have reached their desired family size [1].

Worldwide the contraceptive prevalence rate has been rising in a fast momentum, with the developing countries at

the spotlight [2]. Likewise, the utilization of long acting reversible contraceptive is increasing in some part of the world. Long acting reversible contraceptives are top contraceptives based on effectiveness, Length of effectiveness, Reversibility, Importance of a rapid and predictable return of fertility after stopping a method if the user decides to get pregnant [3].

Unlike the contraceptive methods like the pill or condoms, Long-acting reversible contraceptives, are contraceptives that users do not have to think about taking every day or using every time they have sex. In addition long acting reversible contraceptives are contraceptives that they can be stopped if the user decide to get pregnant. Long acting reversible contraceptives is the most cost effective, and with higher continuation rates than short acting contraceptive methods, thus unwanted births, abortions, dangerous and deleterious effects of pregnancies can be effectively avoided [4].

Practically even though some long acting reversible contraceptive methods are the world's most prevalent form of reversible contraception, the utilization is very low in sub-Saharan Africa. As a part of Sub-Saharan Africa, Ethiopia and its different regional states possess very small percent [4 - 7].

Generally, long acting reversible contraceptive is more effective and covers all the advantage and eliminates the disadvantages of other types of contraceptives. If used properly, it is as effective as permanent methods and the enjoying character of this method is that anyone can reverse fertility in times of need to have children. It can free a woman from using injectable contraceptives every three months, daily pills, or condoms with every act of intercourse during the intended birth intervals [6, 8].

Long acting reversible contraceptive methods is of the more effective and acceptable birth control methods, its acceptability is very low in some countries of the world including in more advanced countries. Most people have limited knowledge, poor attitude (perception of poor efficacy and perception of high side effects) and low practice of it [9, 10].

In Ethiopia Knowledge of contraception is nearly universal. Currently, 27% married women are using modern contraception methods. In the 2011 EDHS the utilization of IUD and Implant is low, 2.1% and 3.4% respectively. In Tigray region the utilization of long acting reversible contraceptive is 2.1% for IUD and 5.6% for Implanon [5].

It is known that the acceptability of contraceptive method is fundamental to correct and consistent use and to continue utilization, if a woman is unhappy with the contraceptive method, for whatever reason, she is likely to discontinue the method. Thus, acceptance determines effective use and continuity of the chosen contraceptive method [11]. Low acceptability of long acting reversible contraceptive could have its own effect on the high unmet need of contraception's [12, 13]. Even though short acting contraceptive methods are mainstays of women's

contraceptive choices, they have lower continuation rates and higher pregnancy rates than long acting reversible contraceptives [11]. Information on the acceptability of long acting reversible contraceptive is Scarce in Ethiopia, although various surveys have been done to assess the utilization and determinant factors of long acting reversible and permanent contraception methods. Thus, there is a need to have information on the acceptability of long acting contraception methods to improve its utilization. So, the aim of this study was to assess the acceptance of long acting reversible contraceptive methods and factors associated with it.

## 2. Methods and Materials

### 2.1. Study Area and Period

The study was conducted in the Tigray Regional State in Mekelle City Governmental Health Institutions. Mekelle City is located 783 Kms North of Addis Ababa. The health services system in Mekelle is consisting of both public and private health care centers. There are three public and four private hospitals. In addition, there are nine health centers and 38 private clinics [14]. Data was collected from February to March 2013.

### 2.2. Study Design and Sampling Techniques

An Institution based cross-sectional study design was used among all family planning users. Sample size was determined using single population proportion with the assumption of acceptance rate of long acting contraceptive in Egypt to be 28.9%, 95% CI, 5% margin of error and non response rate of 10%, the total sample size was estimated to be 348. Finally, the determined sample for each health institution was achieved through pre service interview from Systematically sampled and voluntarily consenting pregnant women with in four weeks of working days. To avoid double counting each card of interviewed mothers was marked using red marker.

#### 2.2.1. Data Collection and Quality Control

Nursing students were trained on the data collection and Interview techniques. Interviewer administered structured questionnaire was used to collect the data. The questionnaire was adapted from different literatures and considering the local situation of the study subjects [5, 12, 13]. The designed questionnaire was translated first into the local language, Tigrigna and back translated to English to ensure its consistency. The questionnaires were pretested in similar settings one week before the data collection and it was used to elicit the following information from the study participants: characteristics of women using family planning, practice of long acting contraceptive methods, knowledge and attitudes towards long acting contraceptive methods and acceptability of long acting contraceptive methods. The completeness and consistency of data were assured through direct and daily supervision of the

supervisor and principal investigators. Data coding and cleaning was performed by cross-checking the printout data for obvious errors to assure quality of data.

### 2.3. Data Management

The data were checked for completeness, accuracy, and those found missing in addressing important variables like the outcome and other important variables was discarded and no longer used as a predictor variable. The data was stored in a secured place for confidentiality and in time of need for a backup of the data.

### 2.4. Statistical Analysis

Data was entered; edited, cleaned and analyzed using SPSS version 20.0 statistical software. Descriptive analysis was done for Socio-demographic, reproductive history, knowledge and attitude of the study participants. Acceptance of long acting reversible contraceptive methods was determined by the proportion of women who are using long acting family planning and accept at least the type of contraceptive they are using. Bivariate logistic regression was used to determine the preliminary relationship between the Socio-demographic, knowledge and attitude related characteristics towards long acting family planning and outcome variable (Acceptability of long acting contraceptive). Collinearity matrix and Hoshmer and Lemshow test were used to test collinearity and assumption of goodness of fit respectively. Finally, characteristics which were found significant at  $P < 0.05$  were taken to multivariate logistic regression to identify the independent predictors of acceptability of long acting contraceptives.

### 2.5. Ethical Clearance

Before conducting the study Ethical clearance was obtained from the institutional review board (IRB) Mekelle University. Permission to conduct the study in each health facility was secured from the respective Health institutions in Mekelle Town. Verbal informed consent was obtained from each study, participants after clear explanation about the purpose of the study.

## 3. Result

### 3.1. Socio-Demographic Characteristics of the Study Participants

A total of 342 married women of reproductive age group had participated in the study with a response rate of 98.3%. One hundred twenty one (35.4%) were between 25-29 years old, and the mean age with (+SD) was 27(+5.4) years. Almost all of the respondents (93.3%) were orthodox followers. Regarding marital status of respondents, 90.4% of them were married. Pertaining to the educational status of participants, 75.7% of the respondents were able to read and write. During the study period, 175 (51.2%) of the respondent's occupation was housewives (Table 1).

**Table 1.** Socio-demographic characteristics of women in Mekelle city, Northern Ethiopia, 2013.

Socio-demographic characteristics	Frequency	Percentage
Age of respondent n=342		
15-19	18	5.3
20-24	99	28.9
25-29	121	35.4
30-34	62	18.1
35-39	33	9.6
40-44	9	2.6
Religion of women n=342		
Christian	323	94.4
Muslim	19	5.6
Ethnicity of women n=342		
Tigray	339	99.1
Amhara	3	.9
Highest grade attained n= 245		
certificate	180	73.5
Diploma	43	17.6
Degree and above	22	9
Occupational status of the women n=342		
Student	18	5.3
Merchant	61	17.8
Government employ	50	14.6
House wife	175	51.2
Daily laborer	38	11.1%

### 3.1.1. Reproductive Characteristics of Family Planning Users

**Table 2.** Reproductive characteristics of women in Mekelle city, Northern Ethiopia, 2013.

Reproductive history of women	Frequency	percentage
Age at first sex n=342		
<18	100	29.2
>18	242	70.8
Age at first birth n=293		
<18	46	15.7
>18	247	84.3
Number of pregnancies n=297		
<2	188	63.3
3-5	97	32.7
>5	12	4
History of abortion n=342		
yes	36	10.5
no	306	89.5
Number of abortion n=36		
one	33	91.7
two and above	3	8.3
Number of live children		
No	51	14.9
1 - 2	195	57
3 - 4	73	21.3
five and above	23	6.7
Number of dead child n=15		
one	13	86.7
two	2	13.3
Decision made on Number of children to have n=342		
Wife	35	10.2
Husband	13	3.8
Both(wife and husband)	294	86

The mean (+SD) age of women during their first sexual intercourse was 18.8 (+2.8) and their mean (+SD) age at first birth was 20.59(+3.0). Most of the mothers (70.8%) and

(84.3%) had sexual intercourse and gave their first birth above the age of 18 years, respectively. The average number of previous pregnancies per mother was 2.4 (+1.5). Out of the total respondents, 10.5% participants had faced one and more than one abortion and 91.7% of them experienced it one time. The median family size was 3.5 (IQR 5, 3) with 55.3% had a family size of three up to four, and 28.1 had five and above family members. Mean (+SD) number of live children per women was 1.88 ( $\pm 1.48$ ) where 195 (57%) of them had one up to two live children (Table 2).

### 3.2. Knowledge and Attitude of Women about Long Acting Reversible Contraceptives

When respondents were asked if they are aware of long acting reversible contraceptives, the majority (83%) reported to be aware of the methods. Of whom 75.4% of them mentioned about implant and 55.8% stated intrauterine contraceptive device. The source of the information mentioned by most of the respondents was a health institution (66.1%) followed by mass media (42.7%). Regarding the purpose of use of long acting reversible contraceptive, (72.8%) of them responded as it is used to limit family size, whereas (63.7%) of them indicate the use of long acting reversible contraceptive to prevent unwanted pregnancy. Above half, 50.6% of the reproductive age women were aware of the return of fertility after removal of long acting reversible contraceptives. Generally, the knowledge score of respondents about long acting reversible contraceptive methods showed that 57 (16.7%) of the respondents were low knowledgeable, 100 (29.2%) were moderately knowledgeable and the remaining 185 (54.1%) of them were highly knowledgeable.

Regarding the attitude to long acting reversible contraceptive revealed that 13.2% of the respondents agreed that the implant can result irregular bleeding. Thirty six (10.5%) agreed it results severe pain during insertion and removal. Of all respondents 161(47.1%) agreed that insertion of IUCD ashamed them. IUCD can prevent from doing different activities were agreed by 124 (36.3%) of the respondents

Regarding the impact of LARC acceptance, it was revealed that 125 (36.5%) of the women agreed that irregular bleeding due to use of implant is risky, and 141(41.2%) agreed that pain with insertion and removal of implant is a big problem. Out of the total 342 respondents 155(45.3%) of the reproductive aged women agreed that it is unnecessary to feel embarrassed with Insertion of IUCD and 48(14%) of the women agreed that restriction from different work activities due to Intra uterine contraceptive device use is highly unacceptable. (Table 4)

Generally, 181 (52.9%) of the respondents had a non supportive attitude towards acceptance of long acting reversible contraceptive methods, whereas 161 (47.1%) of them had a supportive attitude towards LARC acceptance.

### 3.3. Acceptance of Long Acting Reversible Contraceptive by Family Planning User Reproductive Aged Women

The prevalence of long acting reversible contraceptive methods, acceptance was 56 (16.4%). Out of this, majority 45 (80.4%) of the women was accepting implants followed by IUCD 11 (19.6%) as a method of contraceptive.

In this study the Reasons cited for not accepting long acting reversible contraceptive by women were mentioned 128(44.8%) because of the side effects, whereas 117(40.9%) of the women didn't accept LARC because of fear of infertility after use. In addition 38 (11.1%) of them mentioned husband disapproval, 2 (0.6%) medical reason, and the remaining 1 (0.3%) was mentioned service unavailability as the reason.

Regarding future intention to utilize long acting reversible contraceptive methods 183 (53.5%) do have future intention to utilize long acting reversible contraceptive. Of whom 130 (71%) of them will utilize Implant and the remaining 53 (29%) of them are going to utilize intrauterine contraceptive device.

Cross tabulation of the different variables with the outcome variable of acceptance to LARC revealed that more women who were accepting long acting contraceptive were within the age group of 25-29 18 (32.1%), certificate 30 (75%), house wives 32 (57.1%), didn't face abortion 51 (91%), have 1 up to 2 live children 30 (53.5%), and those ages at first birth of 18 and above 39 (84.78%). Majority 50 (89.3%) of the LARC acceptors were women who make joint decisions with their husband on the number of children to have.

Acceptors of LARC with regard to knowledge of the respondents showed that those respondents who were high knowledgeable 60.7%, moderately knowledgeable 33.9% and those who were low knowledgeable 5.4% were acceptors of LARC.

From the total fifty six (56) long acting reversible contraceptive acceptors 64.3% of them were those with supportive attitude and 35.7% of them were those with non-supportive attitude towards LARC acceptance.

### 3.4. Determinant of Long Acting Reversible Contraceptive Acceptance

Bivariate and multivariate logistic regressions were done to assess the predictors of long acting reversible contraceptive acceptance. Variables which were significant in the bivariate analysis at  $p$ -value<0.05 were entered to the multivariate analysis. As a result attitude was remained in the final model. Hence, the result of multivariate analysis showed that mothers who had a supportive attitude regarding LARC were 2 times more likely to accept LARC as compared with those had non-supportive attitude (AOR=2.094, 95% CI (1.109, 3.954) (Table 3).

**Table 3.** Predictors of long acting reversible contraceptive acceptance among women in Mekelle city, Northern Ethiopia, 2013.

Characteristics	Acceptance to LARC			
	Rejecter	Acceptor	COR(95%CI)	AOR(95%CI)
Knowledge of respondents on LARC	N %	N %		
Low knowledgeable	54(94.7%)	3(5.3%)	1	1
Moderate knowledgeable	81(81%)	19(19%)	4.2(1.19-14.96)*	1.9(0.303-12.085)
High knowledgeable	151(81.6%)	34(18.4%)	4.0(1.196-13.73)*	1.95(0.228-16.775)
Health institution as source of information for respondents on LARC				
No	105(90.5%)	11(9.5%)	1	1
Yes	181(80.1)	45(19.9%)	2.373(1.176-4.787)*	1.6(0.705-3.797)
Know IUCD				
No	128(84.8%)	23(15.2%)	1	1
Yes	158(82.7%)	33(17.3%)	1.16(0.65-2.07)	0.7(0.319-1.541)
Know Implant				
No	77(91.7%)	7(8.3%)	1	1
Yes	209(81%)	49(19%)	2.579(1.12-5.938)*	1.44(0.403-5.151)
Attitude of respondent towards LARC acceptance				
Non-supportive	161(89%)	20(11%)	1	1
Supportive	125(77.6%)	36(22.4%)	2.318(1.279-4.201)*	2(1.084-3.75)**
Respondents history of abortion				
No	255(83.3%)	51(16.7%)	1	
Yes	31(86.1%)	5(13.9%)	0.89(0.299-2.17)	0.775(0.28-2.148)

\*\* Remained statistically significant in both crude and adjusted odds ratio in the table

## 4. Discussion

This study attempts to investigate the acceptance of LARC and showed that the overall prevalence of LARCs acceptance was 56 (16.4%), in which majority of the women accepted implant 45 (80.4%) followed by the intrauterine contraceptive device. This result was lower compared to studies conducted in Nigeria, Egypt, and US St. Louis School of medicine [15-17].

The discrepancy might be due to the fact that Nigeria, Egypt and USA are more developed than Ethiopia and the existence of better education, cultural and socioeconomic status of participants might be the core reason for the increased acceptance rate in these countries.

The low IUCD acceptance in the current study might be due to cultural influences related to the procedure of IUCD insertion that leads to have a negative effect on the acceptance of LARC. In addition Sample size in the US and Egypt were greater than the current studies this might lead to the big discrepancy in the result.

In the current study increment of women who were accepting long acting reversible contraceptive were found within the age group of 25-29 18 (32.1%). This is similar with a study conducted in Ethiopia, India and USA [18-20].

In this study the main reason for LARC acceptance was mentioned as preventing unwanted pregnancy (limiting) in 218(63.7%) of the respondents, and decreasing family size(spacing) in 249(72.8%) of the respondents. The results are consistent with a study done in Nigeria and Ethiopia [17, 21].

The current study revealed that 83.6% of reproductive aged women were not accepted LARC. Their main reason

for not accepting it were fear of side effect 128 (44.8%) and fear of infertility after use 117 (40.9%), husband's disapproval in 38 (11.1%). This is spotty with a study conducted in Mekelle, Ethiopia [21]. Whereas it is similar to a study conducted in Zimbabwe [22].

This difference might be due to difference in the study setting of the area, i.e. the current study is institution based and the other is a community based which is attributed to the fact that women in the community might use calendar method, withdrawal method or other short acting contraceptives. In addition, in institutions, there might exist poor provider counseling and having misconceptions towards long acting reversible contraceptives.

Knowledge of LARC method is a prerequisite to accept it and to use it in a timely and effective manner. Even though, in the current study knowledge is not significant, 16.7% of the women were low knowledgeable, 29.2% moderately knowledgeable and the remaining 54.1% were found highly knowledgeable. There is an increment of LARC acceptance in those of high knowledgeable 60.7%, moderately knowledgeable 33.9% and the remaining 5.4% of low knowledgeable. The greater number of LARC acceptors were those who were highly knowledgeable. This is consistent with a study conducted in Mekelle on the factors associated with utilization of long acting and permanent contraceptive methods among married women and a study conducted in America on predictors of LARC use among unmarried young adults [21,23].

Though the current studies finding revealed that a higher percentage of women were aware of LARC, in comparison with other studies the awareness on IUCD was lower than a study which reported in Nigeria Copper T (70.8%), India (77%), and USA (79%) [15, 24, 25].

The discrepancy in IUCD awareness might be due to the difference of the characteristics of the study subjects. In our study the study subjects were not living in the area where information is accessible and they were less exposed to different electronic and print media compared to USA, India and Nigeria.

In this study it is statistically significant that women with supportive attitude had 2 times more likely to accept long acting reversible contraceptive as compared with those who had non supportive attitude (AOR=2, 95% CI (1.084, 3.75).

This study is Consistent with a study done in Ethiopia, India, Nigeria, Bangladesh, Benin and USA [15, 19, 21, 25-27]

The limitation of this could be that it didn't include the qualitative part; due to this it was not possible to capture detail reasons from different angles for not accepting LARC. But, the attempt was made to make the questionnaire more comprehensive to capture detail variables. In addition, it was conducted at institutional level; this might not represent women who didn't come to health institution. But at this period of time, most of reproductive age women are getting family planning services at health institution, the limitation could be minimized

## 5. Conclusion

The acceptance long acting reversible contraceptive was low. Even though the majority of reproductive aged women were high knowledgeable regarding long acting reversible contraceptives, significantly higher women were still didn't have supportive attitude. It is statistically significant that women with supportive attitude had 2 times more likely to accept long acting reversible contraceptive as compared with those who had a non supportive attitude (AOR=2, 95% CI (1.084, 3.75). The low acceptability of long acting reversible contraceptive methods is mostly resulted from the non supportive attitudes of family planning users towards LARC. Other reasons for the low acceptance of LARC were mentioned specifically concerning side effects and fear of infertility after use of the method.

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## Competing Interests

The authors declare that they have no competing interests.

## Authors' Contributions

HG, FH, AD, AB, MA and HY designed the study, analyzed the data, drafted the manuscript and critically reviewed the article.

All authors read and approved the final manuscript.

## References

- [1] Population Reference Bureau, World Population Highlights: Key findings from PRB'S 2009, World Population Data Sheet, Sep. 2009. 64(3). Available: [http://www.prb.org/pdf/09/64.3\\_highlights.pdf](http://www.prb.org/pdf/09/64.3_highlights.pdf) (accessed April 2013)
- [2] Glassier.A, Historical perspective contraception past and future, Lothian Primary Care NHS Trust and University of Edinburgh, 2002. Available: [www.nature.com/fertility/contraception\\_past\\_and\\_future\\_Edinburg](http://www.nature.com/fertility/contraception_past_and_future_Edinburg) (accessed Feb. 2012)
- [3] The clare bale consultancy, long acting reversible contraceptive consumer research report, Wolverhampton, England, March 2009. Available: [www.askforlarc.nhs.uk/Larc\\_consumer\\_research\\_report\\_Wolverhampton](http://www.askforlarc.nhs.uk/Larc_consumer_research_report_Wolverhampton) (accessed march 2013)
- [4] Pile. M, Ndede. F, Ndong. I, Jacobstein. R, Johri. N, Investing in the future- The case for long acting and permanent contraception in sub-Saharan Africa, December 2007, 10-14. Available: <http://www.acquireproject.org/investinfpanclamps/investinginthefuture.pdf> (accessed 10-14 Feb. 2013)
- [5] Ethiopian Demographic and Health Survey, Addis-Ababa, Ethiopia, CSAE' March 2012. Available: [http://ethiopia.usaid.gov/demographic\\_and\\_health\\_survey/Addis\\_Ababa.Pdf](http://ethiopia.usaid.gov/demographic_and_health_survey/Addis_Ababa.Pdf) (accessed march 2013)
- [6] WHO. WHO joins call for renewed focus on Family Planning, Geneva, Switzerland, 11 July 2012. Brown. Available: [http://www.who.int/global\\_health/europe/who\\_joins\\_call\\_for\\_renewed\\_focus\\_on\\_family\\_planning](http://www.who.int/global_health/europe/who_joins_call_for_renewed_focus_on_family_planning), Geneva, Switzerland (accessed 11 Feb. 2013)
- [7] West off. F, Koffman. D, Birth spacing and limiting connections, Dhs Analytical Studies 21, September 2010. Available: [www.measuredhs.com/dhs\\_analytical\\_studies\\_number\\_21\\_birth\\_spacing\\_and\\_limiting\\_connections](http://www.measuredhs.com/dhs_analytical_studies_number_21_birth_spacing_and_limiting_connections) Calverton, Maryland, USA: ICF Macro (accessed Feb 2013)
- [8] Rahman. M, A potential contraceptive method mix for Ethiopian family planning program, 2011. Available: <http://uaps2011.princeton.edu> (accessed Feb. 2012).
- [9] Glasier. A, Scorer. J, Bigrigg. A, attitudes of women in Scotland to contraception: a qualitative study to explore the acceptability of long-acting methods, *Journal of Family Planning and Reproductive Health Care* 2008; 34(4): 213-218.
- [10] Babalola. S, John. N, factors underlying the use of long acting and permanent family planning methods in Nigeria: The Respond Project, August 2012, number 5. Available: <http://www.respondproject.org/pages/files/6-pubs/researchreports/study5-usedynamicstudyNigeria>. (Accessed Feb. 2012).
- [11] RCOG, The effective and appropriate use of long-acting reversible contraception, London, UK, RCOG, 2005. Available: [www.ncbi.nlm.nih.gov/effective\\_and\\_appropriate\\_use\\_of\\_long\\_acting\\_reversible\\_contraceptive](http://www.ncbi.nlm.nih.gov/effective_and_appropriate_use_of_long_acting_reversible_contraceptive), London (accessed Feb. 2012).

- [12] Brown. L, Growth in world contraceptive use stalling, March 27, 2012. Available: [http://www.treehugger.com/health/growth\\_in\\_world\\_contraceptive\\_use\\_stalling](http://www.treehugger.com/health/growth_in_world_contraceptive_use_stalling) (accessed march 27, 2013).
- [13] Hartman. L, Shafor. M, Pollack. L, Wibblesman. C, Chang. F, parent acceptability of contraceptive methods offered to their teen during a confidential health care visit, *sex transm infect* July 2011, 87(1).
- [14] Central Statistical Agency (CSA) and ORC Macro (2006). *Ethiopia Demographic and Health Survey (DHS) 2005* (Addis Ababa, Ethiopia and Calverton, USA: Central Statistical Agency and ORC Macro). Available: [http://books.google.com.et/books?id=UZDdjyt7BMC&pg=CentralStatisticalAgency\(CSA\)andORCMacro\(2006\).EthiopiaDemographicandHealthSurvey\(DHS\)2005\(AddisAbaba\).pdf](http://books.google.com.et/books?id=UZDdjyt7BMC&pg=CentralStatisticalAgency(CSA)andORCMacro(2006).EthiopiaDemographicandHealthSurvey(DHS)2005(AddisAbaba).pdf) (accessed march 2013).
- [15] Mastad. R, Secura. G, Allsworth. E, et al, Acceptance of long-acting reversible contraceptive methods by adolescent participants in the Contraceptive choice Project, *Journal of contraception*, April 27, 2011.
- [16] Safwat. A, Momen. A, Omer. M, Hossam. T, Acceptability for the use of postpartum intrauterine contraceptive devices, *Assiut Experience, Medical Principles and practice*, 2003, 12, 170-175.
- [17] Ozumba B, Chukudebelu W, Snow R, Norplant as a contraceptive device in Enugu, Eastern Nigeria, *Advances in contraception*, 1998; 14: 109-119.
- [18] Mengistu A, Elizabeth G, Yewondwossen T, Elizabeth O, Addressing unmet need for long acting family planning in Ethiopia: Uptake of implanon and characteristics of users, *Pathfinder International*, August, 2012. Available: [http://www.pathfinder.org/addressingunmetneedforlongacting\\_family\\_planning\\_inEthiopia.html](http://www.pathfinder.org/addressingunmetneedforlongacting_family_planning_inEthiopia.html) (accessed March 2013).
- [19] Respond project brief, Acceptability of Sino-Implant (ii) in Bangladesh, Newyork, No 7, July 2012. Available: <http://www.k4health.org/respondproject> Acceptability of Sino-Implant (ii) in Bangladesh (accessed July 2013).
- [20] Kavanaugh. L Phd, Jerman. J Mph, Hubacher. D phd, Kost. K phd, Finer. B phd, Characteristics of women who use long acting reversible contraceptive methods in the United States, 2002 and 2006-2008. *Obstetrics and Gynecology*. 2011 Jun; 117(6):1349-57.
- [21] Alemayehu M et.al, Factors Associated with Utilization of Long acting and Permanent Contraceptive Method among Married Women of Reproductive Age in Mekelle town, Tigray Region, North Ethiopia, *BMC pregnancy and child health*, 2012, 12/6, 1471-2393.
- [22] Pester Siraha, The reasons for low utilization of long acting contraceptives amongst HIV positive women at Harare post test support services clinic, Zimbabwe, march 2013. <http://scholar.sun.ac.za/bitstream/handle/10019/sirahareasonns.pdf> (accessed April, 2013).
- [23] Dempsey AR, Billingsley CC, Savage AH, et al. Predictors of long-acting reversible contraception use among unmarried young adults. *Am J ObstetGynecol* 2012; 206:526.e1-5.
- [24] Olusegun. A, Ololade. K, Ireti. O, minimizing the risk of unwanted pregnancies among female University Undergraduates in Logos Nigeria: The Quantum of knowledge and use of long acting reversible contraceptives, *Research. Journal Med. Sci*, 2012 6(4): 181-186.
- [25] Khan E, Sitanshu S, Vikas K, Pratibha P, Itare P, Sandhya B, Increasing the accessibility, acceptability and use of IUD in Gujarat, India, May 2008. Available: <http://www.popcouncil.org/pdfs/frontiers/FRfinalreports/indiaiud.pdf> (accessed may 2013).
- [26] Goraya. R, Lakshmi. A, Saraya. L, Takkar. D, Hingorani. V, Demographic and psychosocial correlates associated with the acceptability of implant method of contraception in comparison with Copper T intrauterine device, *Health and Population – perspective and issues*, 1981, 4(2), 95-105.
- [27] AO Aisien, ME Enosolease, Safety, Efficacy and acceptability of implanon a single rod Implantable contraceptive (Etonogestrel) in University of Benin Teaching Hospital, *Nigerian Journal of clinical practice*, sept. 2010, 13(3): 331-335.